

WHAT IS CLAIMED IS:

1. An image synthesis apparatus, comprising:

a right infrared camera and a left infrared camera;

a right visible light camera and a left visible light camera; and

a first image synthesis processing device for synthesizing data output from the right infrared camera and the left infrared camera and data output from the right visible light camera and the left visible light camera so that a three-dimensional thermal image and a three-dimensional visible light image are observed by an observer as overlapping each other.

2. An image synthesis apparatus according to claim 1, wherein the first image synthesis processing device includes:

a synchronous signal generator for generating a synchronous signal;

a second image synthesis processing device for synthesizing at least a portion of right infrared image data output from the right infrared camera and at least a portion of right visible light image data output from

the right visible light camera in response to a synchronous signal generated by the synchronous signal generator so as to generate right synthesis image data;

a third image synthesis processing device for synthesizing at least a portion of left infrared image data output from the left infrared camera and at least a portion of left visible light image data output from the left visible light camera in response to a synchronous signal generated by the synchronous signal generator so as to generate left synthesis image data; and

a data output device for outputting the right synthesis image data and the left synthesis image data in a prescribed order in response to a synchronous signal generated by the synchronous signal generator.

3. An image synthesis apparatus according to claim 2, wherein:

the second image synthesis processing device synthesizes a portion of the right infrared image data and the entire right visible light image data, and

the third image synthesis processing device synthesizes a portion of the left infrared image data and the entire left visible light image data.

4. An image synthesis apparatus according to claim 2, further comprising a monitor for displaying a right synthesis image and a left synthesis image in a prescribed order based on the right synthesis image data and the left synthesis image data which are output from the data output device.

5. An image synthesis apparatus according to claim 4, further comprising a polarizer for polarizing the right synthesis image in a first direction and polarizing the left synthesis image in a second direction different from the first direction, in response to a synchronous signal generated by the synchronous signal generator.

6. An image synthesis apparatus according to claim 1, wherein the first image synthesis processing device includes:

a synchronous signal generator for generating a synchronous signal; and

a data output device for outputting right infrared image data output from the right infrared camera, right visible light image data output from the right visible light camera, left infrared image data output from the left infrared camera, and left visible light image data

output from the left visible light camera in a prescribed order, in response to a synchronous signal generated by the synchronous signal generator.

7. An image synthesis apparatus according to claim 1, wherein the first image synthesis processing device includes:

a second image synthesis processing device for synthesizing right infrared image data output from the right infrared camera and left infrared image data output from the left infrared camera so as to generate three-dimensional thermal image data;

a third image synthesis processing device for synthesizing right visible light image data output from the right visible light camera and left visible light image data output from the left visible light camera so as to generate three-dimensional visible light image data; and

a fourth image synthesis processing device for synthesizing the three-dimensional thermal image data and the three-dimensional visible light image data so as to generate three-dimensional overall image data.

8. An image synthesis apparatus according to claim 7,

wherein the three-dimensional thermal image data includes a plurality of temperature levels, and a plurality of color tones are respectively assigned to the plurality of temperature levels.

9. An image synthesis apparatus according to claim 7, wherein the three-dimensional overall image data includes three-dimensional coordinate data, and the three-dimensional overall image data is converted into two-dimensional data by transforming the three-dimensional coordinate data into two-dimensional coordinate data projected onto a prescribed plane in a three-dimensional coordinate space.

10. An image synthesis apparatus, comprising:

- a slit device including a plurality of slits;
- an infrared directing device for directing infrared toward a subject through the slit device;
- a plurality of infrared cameras provided in a direction substantially perpendicular to a direction in which the infrared is directed toward the subject; and
- an image synthesis processing device for synthesizing a plurality of thermal image data output from the plurality of infrared cameras so as to generate

three-dimensional thermal image data.

11. An image synthesis apparatus according to claim 10, wherein the image synthesis processing device generates the three-dimensional thermal image data based on a difference in shape between heat ray patterns reflected by the subject and respectively imaged by the plurality of infrared cameras.